AMENDMENTS TO THE CLAIMS:

The listing of claims will replace all prior versions, and listings of claims in the application:

LISTING OF THE CLAIMS

1-10. (Cancelled)

11. (Previously Presented) A method for optimizing the location of an in-mold coating injection port in a mold so as to minimize the flow time for an in-mold coating composition to flow over at least a part of a molded article, said method comprising the steps of:

predicting a coating composition fill pattern in said mold;

using said pattern to determine optimal placement of a coating injection nozzle so as to minimize the flow time for an in-mold coating composition to flow over at least a part of a molded article and to reduce the presence of surface defects of a coating formed from said in-mold coating composition;

placing said injection nozzle in said optimal placement position~~,~~; and

using said method in conjunction with a method to minimize a cure time of the in-mold coating composition;

wherein said step of predicting a coating composition fill pattern in said mold is performed by determining the relationship between a pressure in said mold and a flow rate of said coating composition by using a finite difference method comprising the steps of:

a) defining a fixed spatial step to track a flow front location of the in mold coating composition,

b) advancing the flow front location by one spatial step for a fixed time increment,

c) obtaining the pressure and coating composition thickness distributions for said in mold coating, and

d) repeating said steps until the in mold coating composition is complete.

12. (Previously Presented) The method according to claim 11, wherein said method is encompassed in instructions contained in a computer readable medium.

13. (Previously Presented) The method according to claim 11, wherein the steps of predicting a fill pattern and determining optimal placement of said nozzle are performed by a computer.

14. (Previously Presented) The method according to claim 13, wherein data necessary for performing said steps is input into said computer by a user.

15. (Previously Presented) The method according to claim 13, wherein data necessary for performing said steps is automatically provided to said computer by an instrument taking differential scanning calorimetry measurements.

16. (Previously Presented) The method according to claim 15, wherein said data is stored in a data collection means associated with said instrument and then relayed to said computer.

17. (Previously Presented) The method according to claim 11, wherein said process minimizes the potential for surface defects in an in mold coating formed on a surface of said molded article.

18. (Previously Presented) The method according to claim 11, wherein said method is used for an in-mold coating process including at least filling, packing, and solidification phases.

19. (Cancelled)

20. (Previously Presented) A method for optimizing the location of an in-mold coating injection port in a mold so as to minimize the flow time for an in-mold coating composition to flow over at least a part of a molded article, said method comprising the steps of:

predicting a coating composition fill pattern in said mold over at least a two dimensional surface;

using said pattern to determine optimal placement of a coating injection nozzle so as to minimize the flow time for an in-mold coating composition to flow over at least a part of a molded article and to reduce the presence of surface defects of a coating formed from said in-mold coating composition;

placing said injection nozzle in said optimal placement position; and

using said method in conjunction with a method to minimize a cure time of the in-mold coating composition, wherein said step of predicting a coating composition fill pattern in said mold is performed by determining the following a) the relationship between a fluidity, S, of an in mold coating composition and a pressure gradient present in said mold, and b) the relationship between the coating thickness of the in mold coating composition and injection pressure.

21. (Previously Presented) The method according to claim 20, wherein a finite element method combined with a control volume approach can be used to numerically determine said relationships.

22. (Previously Presented) The method according to claim 20, wherein said method is encompassed in instructions contained in a computer readable medium.

23. (Previously Presented) The method according to claim 20, wherein said steps of predicting a fill pattern and determining optimal placement of said nozzle are performed by a computer.

24. (Previously Presented) The method according to claim 23, wherein data necessary for performing said steps is input into said computer by a user.

25. (Previously Presented) The method according to claim 23, wherein data necessary for performing said steps is automatically provided to said computer by an instrument taking differential scanning calorimetry measurements.

26. (Previously Presented) The method according to claims 25, wherein said stat is stored in a data collection means associated with said instrument and then relayed to said computer.

27. (Currently Amended) The method according to claim [[10]], 20 wherein said process minimizes the potential for surface defects in an in mold coating formed on a surface of said molded article.

28. (Previously Presented) The method according to claim 20, wherein said method is used for an in-mold coating process including at least filling, packing, and solidification phases.

29. (Cancelled)